BPM IN FINANCIAL SERVICES
Good Advice from the Real World

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BPM Architectures at Capital One
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Capital One at a glance

• A leading diversified bank with $330.3 billion in assets, $228.9 billion in loans and $221.8 billion in deposits¹
  – 8th largest bank based on U.S. deposits²
  – 5th largest retail depository institution in metro New York³
  – Largest consumer and commercial banking institution headquartered in the Washington, DC region
  – 4th largest credit card issuer in the U.S.⁴
  – The 3rd largest issuer of small business Visas and MasterCards in the U.S.⁵
  – The 4th largest financial institution auto loan originator⁶
  – Largest U.S. direct bank⁷

• Major operations in 15 U.S. cities, Canada, U.K.
• More than 65 million customer accounts and 45,000 associates
• A FORTUNE 500 Company - #126
• Numerous recent awards including:
  – Named to 100 Best Companies to Work For by FORTUNE Magazine
  – Best Places to Work for LGBT Equality by Human Rights Campaign
  – Received J.D. Power & Associates Call Center Certification
  – Aon Hewitt’s Top Companies for Leaders
  – Named to Working Mother’s 100 Best Companies list & Best Companies for Hourly Workers
  – Ranked #8 on Military Times’ 2014 “Best for Vets”
  – Recipient of the Secretary of Defense Employer Support Freedom Award

1) Source: Company reported data as of Q1’16
2) Source: FDIC, Domestic deposits ranking as of Q4’15
3) Source: FDIC, June 2015, deposits capped at $1B per branch
4) Source: Company-reported domestic credit card outstandings, Q1’16,
6) Note: Financial institutions includes banks & specialty finance lenders,
Source: AutoCount, FY 2015
7) Source: FDIC, company reports as of Q4’15
We have transformed the company into a top 10 bank

• 2015 – Acquires GE Capital’s Healthcare Finance, Level Money and Monsoon
• 2014 -- Acquires Adaptive Path, a digital design leader and AmeriCommerce, an online e-commerce company
• 2013 – Acquires Beech Street Capital, an originator, underwriter and servicer of multifamily commercial real estate loans
• 2012 - Acquires ING DIRECT, HSBC US Card portfolio
• 2010 - Enters into card partnerships with Kohl’s and Sony in the US and Hudson’s Bay Company and Delta in Canada
• 2009 - Acquires Chevy Chase Bank in the Washington, DC area
• 2006 - Acquires North Fork Bank, one of the largest banks in the New York metro area
• 2005 - Acquires Hibernia National Bank, #1 bank in Louisiana
• 2002 - Launches its Small Business credit card
• 2000 - Introduces slogan, “What’s in your wallet?”
• 1998 - Enters Auto Finance Market
• 1996 - Expands into Canada and the U.K.
• 1994 - Initial Public Offering (IPO)
Our focus is to recruit great people and create an environment where they can be great

- **FORTUNE World’s Most Admired Companies**
- “100 Best Companies to Work For” *FORTUNE* magazine (We do not have the new logo yet)
- “NAFE Top Companies For Executive Women” *The National Association for Female Executives*
- “America’s Top Corporations for Women’s Business Enterprises” *Women’s Business Enterprise National Council (WBENC)*
- “U.S. President’s Volunteer Service Award” *Junior Achievement*
- “100 Healthiest Workplaces in America” *Healthiest Employers*
- “Top 125” *Training magazine*
- Top Entry Level Employer by *CollegeGrad.com*
- “Best Places to Work” in Tampa, Dallas, Houston, Tulsa, Richmond, Chicago and Oklahoma
- No. 1 on 2016 *Information Week “Elite 100”*
- “Best Places to Work for LGBT Equality” *The Human Rights Campaign Foundation*
- “Working Mother 60 Best Companies” *Working Mother magazine*
- Military Times’ 2016 “Best for Vets”
- G.I. Jobs Military-Friendly Employers and Military-Friendly Spouse Employers
- America’s Top 50 Organizations for Multicultural Business Opportunities” *DiversityBusiness.com*
- “WE USA Corporations of the Year” *Women Enterprise USA*
- “Top 50 Employers” in *CAREERS & the disABLED Magazine*
Technical Use Case – Human Workflow with API

- Allows Custom UI to be leveraged and integrate on the backend with jBPM APIs
Technical Use Case – Headless Workflow / System to System

• Automates the calling of APIs in a particular order
• Can integrate human workflow / User Tasks as needed
Technical Use Case – Integrate Business Rules into a Workflow

- Ability to invoke a set of rules (RuleFlow Group) at a particular point in the workflow (Business Rules Task)
• Application can interact with it via REST, JMS, Java APIs
• Decouples the workflow and/or rules from the application
• Enables the service to be reused by multiple applications
• Is typically used for stateful, long running, async approaches (human workflow)
Technical Use Case – Embedded deployment to add workflow to an existing application

- Runs as part of the application, under the same JVM
- Provides the best overall performance
- Can leverage all capabilities of the API
- Is typically used for stateless transactions (e.g. rules or non-stateful workflow)
• Can leverage sub-processes to break workflows up into smaller pieces
• Avoid creating dependencies
  – Each BPM Suite microservice could have its own execution server & process database
  – Want to avoid sharing an Execution Server across microservices or microservice
• Make the interactions atomic and understand the workflow boundaries to keep the microservice stateless

Monolithic applications…

can have many dependencies
can be challenging to make a change
Key Technical Lessons Learned

- Keep the database and application service in the same geographical region
- Minimize the # of API calls
- Strive for parallel, async activities
- Chose the right strategy for the RuntimeManager that matches your use case
  - Singleton - runtime manager maintains single KieSession regardless of number of processes available
  - Per Request - runtime manager delivers new KieSession for every request
  - Per Process Instance - runtime manager maintains mapping between process instance and KieSession and always provides same KieSession whenever working with given process instance
- Build up SMEs & establish a Community of Practice
Finacle and Red Hat JBoss BPM Suite

Peter Loop
Associate Vice President and Principal Technology Architect
Infosys
Infosys - A global leader in consulting and technology

- $9.2 billion annual revenues, 193,000+ staff / 98 nationalities
- 1000+ clients globally
- Offices in 40 countries & 77 cities
- Over 33.5% of revenues from FSI
- Product Subsidiary - EdgeVerve
- Product offerings from 20+ years
Finacle Universal Banking Solution

**Comprehensive solution offerings** - Core banking, Internet banking, Mobile banking, Payments, CRM, Wealth management, Treasury, Origination, among others

**Global Coverage**
- 84 Countries
- 480+ Installations
- Bank sizes from USD 100 Million to 1 Trillion

**Serves 16.5 percent** of world’s adult banked population. Over 547 million customers access their finance through Finacle software.

**A leader in the industry**
- Providing mission-critical software globally
- Proven to be most scalable platform

Infosys has been positioned as a leader in the Gartner Magic Quadrant for Global Retail Core Banking, 9 times in a row
Finacle supports multiple Red Hat products

Performance test with 218 TPS with plenty of headroom

BPM Life Cycle and Participants

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Finacle BPM Solution – Logical Architecture

- Process Instantiation,
- Step closure,
- Step Assignment,
- E.t.c

Automated Service Calls

- Store Step Details
- Process Completion
- Step Escalation
- Store Automated Step Error

Finacle Workflow Adaptor

- Routing API
- Escalation API

Finacle Applications
(CASA, DEPOSITS, ORIGINATION, CIF, Internet Banking)

FI

FWI Inbox

Finacle Workflow Infrastructure
Finacle Components
JBPM
Interface with JBOSS BPM Suite

Application UI → Application API → Common Inbox → Workflow I/F → JBOSS BPM

1. Launch application menu
2. Application specific routing
3. Assign to group/ self tray
4. Move item from group to self tray
5. Application UI is reused at runtime. It is feasible to reuse design time metadata during modeling.
6. Mark step completed
7. Automated step - API
8. Reply
9. Start Process
10. Inform about manual step
11. Claim and start manual step (REST)
12. Mark step completed
13. Assign to special UG
Import application specific metadata for actions
Interface to Rules Engine

- Finacle Java code
- Java based FinRule client
- FinRule EJB endpoint
- FinRule DB
- FinRule server
- C++ based FinRule client
- Finacle C++ code
- FinRule EJB endpoint
- DROOLS APIs
- Message adapter
- DROOLS rule set repository
- DROOLS APIs
- FinRule Processor
- FinRule DB
Practical usage of rule engine
Contact information:
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Thank you

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BPM Architectures at SIA

Emanuele Montrasi, Interoperability Payments Manager, SIA
Stefano Marfella, Extra
About SIA

THE GROUP

The Network of Excellence

BUSINESS HIGHLIGHTS

Founded in July 1977

European leader in the areas of payments, cards, network services and capital markets

EUROPE

Frankfurt

Warsaw

London

Budapest

Parma

Macerata

Rome

AFRICA

Pretoria

Utrecht

Brussels

Turin

Milan

SERVES CUSTOMERS IN 40 COUNTRIES
Full range of core services for each customer
Old Pre-Billing Solution & Pain Point

- Mainframe Application
- Rules inside the code
- Developers bear the rule management process
- Integration of a small number of SIA services
- Different Data Bases for pre-billing system and business intelligence
- No authorizing process
- No simulation feature
The Open Source Choice

- Drive for Application Modernization
- Opt for Red Hat BPM Suite (based on previous experiences with Red Hat products)
- Opt for the Red Hat Advanced Business Partner EXTRA
3 operating offices in Italy
1 Office in London
About 70 employees
Graduates in computer engineering, Science, Business, Film production and ...
Over 300 projects worldwide in 11 countries
BRMS Integration

- BRMS integration through web services
- BRMS as rule repository and rule engine
The Authorizing Process at the end of the simulation phase directly promotes Business Rules from Simulation Environment to Live Environment creating a Hot Continuous Delivery Process.
Main Achievements

- Simulation System
- Rule Management Process
- Rule Versioning System
- Business Rules Hot Deployment
- Cross Platform Integration
- Cross Platform Bimodal Development
Next Steps

- New Big Data from pre-billing DB
- Re-writing of old mainframe services
- Transferring of BPM Know-how to other authorizing processes
LEARN. NETWORK.
EXPERIENCE OPEN SOURCE.